Making the Male Manager: Can Non-Cognitive Skills Explain the Glass Ceiling?

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Making the Male Manager:
Can Non-Cognitive Skills Explain the Glass Ceiling?

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Abstract: This project examines whether men and women’s non-cognitive skills—or personality characteristics—influence their respective occupational attainment. I take an interdisciplinary approach to inform my hypothesis by incorporating psychological and sociological theories on the production and reproduction of gender roles in order to understand why men and women may systematically differ along some personality dimensions. I use linear probability and probit models to measure the effect of the non-cognitive traits, locus of control, self-esteem, and risk tolerance on the probability of being a manager. In both models I find that an internal locus of control, high self-esteem, and high risk tolerance all increase the probability of being a manager, albeit by a small, but statistically significant amounts (p<.05). I also find that men have greater returns to self-esteem than women do, suggesting that women’s lower occupational attainment is affected both by the traits they possess, and the way these skills are perceived and rewarded in the labor market.

Keywords: gender, non-cognitive skills, occupation, labor,

JEL classification: J16, J24, J31
PLAGIARISM STATEMENT
I have written this project using in my own words and ideas, except otherwise indicated. I have subsequently attributed each word, idea, figure and table which are not my own to their respective authors. I am aware that paraphrasing is plagiarism unless the source is duey acknowledged. I understand that the incorporation of material from other works without acknowledgment will be treated as plagiarism. I have read and understand the Bard statement on plagiarism and academic honesty as well as the relevant pages in the Student Handbook.

Nora Harrington
I’d like to thank my parents for their love, support, and making it possible for me to attend Bard; my sisters, Meg and Clara; Vanessa, for feeding me all semester; Quentin for helping me find my head when it wasn’t attached; Professor Martell for being patient (I hope your future advisees are better organized); and finally, Bard College as a whole. I’ve learned a lot.
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Section 1: Introduction

The phrase, “the glass ceiling”, has been a common phrase since its inception in the 1980s\(^1\). The near-invisible, but ever-present and incessant form of discrimination that women face in their careers could not have been given a more apt metaphor. It perfectly illustrates the subtlety of modern day gender prejudice, while capturing the seemingly illusory nature of equality, all while evoking the confusion one would feel after hitting her head against an invisible obstacle.

Today, the expression verges on cliché, as young women and men have turned away from the second-wave feminism of their parents’ generation. It’s gone from a clever feminist critique of a pervasive phenomenon to the name of Presidential commission on pay equality. Yet the ubiquity of the expression surely signals an acknowledgement on the part of the country that gender inequality is not only a modern reality, but also a serious issue that poses problems for society as a whole.

In the thirty years since the phrase was coined it has been deployed thousands of times in op-eds, protests, speeches, academic articles, and HR meetings; however, while there has doubtlessly been huge steps taken in the direction of a gender-equality, the consensus, at least among those affected, is that the glass ceiling is still very much intact. Last year I witnessed feminists across the country, not excluding those outraged by Madeline Albright’s sexist threat of damnation and under-enthusiastic about Mrs. Clinton’s politics, be filled with optimism at what seemed like an imminent blow to the glass ceiling; myself included.

\(^1\) There is no consensus as to whom first used the “glass ceiling” as a metaphor for obstacles females face in the workplace, however, most sources date it’s emergence to sometime in the 1980s.
Hillary Clinton’s loss to Donald Trump was about more than her gender, but I saw it as a perfect symbol of the plight of successful American women; she can be hugely successful, but cannot usurp the most powerful men. Her justified confidence in herself as the more experienced, intelligent, and capable candidate was used against her; she was described, not only by Republicans, or the media, but by most men (but certainly not just by men) as smug, cold, and conniving, and she paid for it dearly. Hillary Clinton’s loss was not what sparked my interest in this topic per say, but I think it is an illuminating narrative of the state of gender equality today.

Men and women are received differently based on their personality. When men have traits that make them successful leaders they are rewarded, and their traits and actions that are harmful and sometimes even disgusting are waved away so long if they fit into the masculine model of leadership. In women however, traditional leadership traits such as confidence, assertiveness, and motivation are often looked over, or seen as masculine, pushy, or, worse, bitchy.

These different receptions are the outcomes and causes of gender norms that prevent women from holding leadership roles. They perpetuate these roles by enforcing the idea that only men are built to be leaders. When men dominate leadership roles, traditionally masculine characteristics, even those that seem antithetical to good leadership, such as sexism, become woven in with this ideal. This results in traits like this being encouraged in boys and not in girls, perpetuating this phenomenon, and further causing unequal economic outcomes for men and women.
In my project, I empirically test if differences in personal characteristics and returns to these characteristics are barriers to women’s career attainment. To do this, I use linear probability and probit models with data from the 1979 National Longitudinal Survey of Youth (NLSY79) to test personality traits’, commonly referred to as “non-cognitive skills” in economic and sociological literature, effect on the chances of holding a management position. The measures of personality included in the data are locus of control, self-esteem and risk aversion, which differ between managers and non-managers and males and females. I hypothesize that these traits affect the likelihood of being a manager and that returns to these traits will differ by gender.

The role of non-cognitive traits on economic, and more generally, life outcomes is becoming increasingly popular in studies of inequality between genders, races, and socio-economic groups, as traditional explanations, such as education, become increasingly less able to explain these differences. I contribute to this literature by using a new dependent variable, management status, which I argue is a more theoretically relevant measure than the often used variable, wages, because personality directly influences how a worker’s leadership potential is perceived. Furthermore, I depart from existing economic literature by offering an interdisciplinary analysis of the wage gap and occupational segregation. My analysis, while covering traditional economic theories, incorporates psychological, sociological, and historical theories to explain how gender norms are formed and perpetuated, and thus contribute to economic inequality. I believe that an interdisciplinary approach, which studies deeply rooted gender roles is crucial in studies which measure the effect of personality on unequal outcomes because omitting these mechanisms dangerously oversimplifies the issue; it risks putting the onus on women to change their personalities to conform to the hegemonic masculine mode of
leadership instead of seeing inequality as a self-perpetuating phenomenon, and thus a systemic societal issue. I outline the organization of my paper in the following paragraph.

In subsections 2.1 and 2.2, I examine the various neoclassical economic theories about why the gender wage gap persists in the U.S. This section primarily focuses on human capital theories, the division of household labor, and gender discrimination. In 2.3, I discuss occupational segregation, as this affects the wage gap, but requires a more nuanced view of the institutional and structural barriers women face. In Section 3, I examine how gender differences in personality may have arisen and are perpetuated today. In Section 4, I relate non-cognitive skills to their effect on workplace experiences. In Section 5, I empirically test my hypothesis that the non-cognitive traits locus of control, self-esteem, and risk aversion are an important contributor to gender inequality by using linear probability and probit models.
Section 2: The Wage Gap

Trends, History, and Theories

2.1 Introduction to the Wage Gap

Over the past century, women have made significant advances in their pursuit of economic equality. The gender wage gap remained largely stagnant for the first half of the century then substantially decreased in the 1980s. Women went from making 60.2% of men’s salaries in 1980 to 70.1% in 1990. It stands at 79.6%, as of 2015 (“The Wage Gap over Time, 2016). This narrowing was due primarily to changes in human capital and social attitudes about gender. In the 1960s and 70s men were more likely than women to have college degrees; however, in the last few decades, women have responded to increased demand for post-secondary education by pursuing college education (Goldin 2006). Beginning in 1982, the majority of undergraduate degrees were earned by women; since 2006 this has been true of graduate degrees as well (NCES 2016). Since the early 1990s, the pace of convergence between male and female wages has slowed down, with the largest gap found at high education and income levels (see fig. 1). In addition, trends related to the wage gap such as increases in female labor force participation rates and reductions in occupational segregation by gender have also plateaued since the 90s (Blau and Kahn 2016).
The continued existence of a significant gender wage gap defies easy explanation, especially given the dramatic social changes as well as legal ones that have taken place over this same period. The Equal Pay Act of 1963 made it illegal to pay different wages to men and women if they perform equal work in the same workplace and to retaliate against someone because he or she lodged a complaint about discrimination. Title VII of the Civil Rights Act of 1964 made it illegal to discriminate against someone on the basis of race, color, religion, national origin, or sex and was amended in 1978 to include pregnancy status.

These acts were both milestones when it came to enforcing pay equity and acknowledging as a country that unequal pay for the same work was unacceptable. However, since the wage gap has narrowed significantly since then, and discrimination may be the result of implicit biases and less explicit than in was in the 60s, constructing policy to meaningfully improve women’s relative pay and workplace experience has become more challenging.

The first step to this is to locate specific sources of the disparity in order to rectify it. This is tricky, as there are several competing theories as to why the wage gap exists. Each of these theories suggests conclusions about what should be done to eliminate the gap – if anything should be done at all.
2.2 Economic Theories and Their Critiques

Neoclassical theories assume a competitive labor market, wherein employers will only hire employees whose value to the firm is at least equal to their wages; the more productive the worker is, the higher the wage. The human capital theory is a supply-side theory that explains why women may be less productive on average as a result of their rational investment decisions based on their expected specialization in the household, due to the division of labor between her and her husband. The statistical discrimination theory seeks to explain why it may be utility maximizing for a firm to base hiring decisions on average group characteristics in the absence of complete information, which may negatively affect women’s wages or chances of getting hired. The taste for discrimination theory explains how employers rationally respond to their irrational discriminatory preferences, which causes employers to regard female labor as more expensive than their competitive wage, leading to underemployment.

2.2.a. Human Capital Theory

One of the most popular theories to explain the wage gap is the human capital theory. Human capital refers to the education, training, habits, health, and social and personal characteristics which contribute to productivity in the labor market. While some of these attributes may be inherent or developed without consideration of their effects on productivity, many (especially education) are the result of investments made with future earnings and labor force participation in mind. It is not a given, of course, that women inherently have lower human capital. According to the theory, a woman’s lower human capital is a result of her rational choices. If women expect to spend less time participating in the labor force over the course of their lifetime, then the benefits of investing in their human capital are lower. Since,
on average, women work fewer hours throughout their lives, they do not expect a high return on their investments, so they rationally do not invest as much in, likely costly, education and training (Becker, 1962)(Mincer and Polachek 1974).

However, there is evidence against the human capital theory as it relates to the wage gap. Women as group are now more educated than men, so it is unlikely that this can still explain these differences in wages and occupational attainment. Weinburger (1998) shows that once all educational factors including, but not limited to, GPA, quality of college, and major have been controlled for there remains a 9% gap in the earnings between men and women only one year after college graduation, which suggests that the gap is caused by factors unrelated to their educational investments.

2.2.b. The Household Division of Labor

Household considerations may motivate women to engage less in the labor market and therefore earn less. Such a pattern would compound the effect of women’s lower returns to human capital investments. In Gary Becker’s Treatise on the Family (1981), Becker models the division of labor and intra-household allocation of resources. His theory can be used to understand the sources and outcomes of between-sex differences in labor force participation, earnings, and human capital. According to this theory, a couple displaying rational decision making should have one partner specializing in household production and the other in market work due to their different specialized human capital investments in one of these sectors, resulting in at least one partner dedicating all their time to production in either the labor market or the household. Combined, their potential consumption is larger than the sum of their separate ones. Becker’s model is based on the Ricardian model of comparative advantage. Becker
stresses that this model holds for people who are identical from birth, but it may be more salient when biological factors come into play.

Due to biology, women have a comparative advantage to men in household production even if they make identical human capital investments, because, compared to women, men are biologically disadvantaged in the household sector. Women can and often do bear children and because this is a taxing feat, women have a greater willingness to divert time and energy into their children in order to garner the largest returns on this major physical investment. Women can also care for their other children while pregnant or nursing, further cementing their place in the home instead of the labor market.

The differences in the biological reproductive roles of males and females can cause small differences in comparative advantage to compound into distinct life roles. Society benefits from perpetuating these roles; the bigger these differences are, the greater the rewards of specialization. This male breadwinner/ female homemaker binary signals to parents what investments to make in their children’s human capital based on an assumption of biological advantage,. This is true even if their children are not naturally advantaged in their traditional gender roles, as, on average women will be better at household production and men at market production. The rational response to this will thus be for parents to teach their children based to the assumption that the expected partner will specialize in the way others of their do, thus when they are adults they will be able to perpetuation this traditional division (Becker 1981). The intergenerational transmission of gender roles can explain the pervasiveness and preservation of distinct spheres for men and women for much of history (Becker 1981).
A women’s human capital would also be affected by discontinuous labor force participation stemming from home commitments because this capital may atrophy during time spent out of work. Through this mechanism, small differences in comparative advantage are reinforced by utility-maximizing human capital investments and can translate to large disparities in the earnings of men and women (Mincer and Polachek, 1974).

Neoclassical theories imply that that the best ways of reducing the wage gap are through non-market factor focused policies. These may include promoting non-gendered education both in school and at home from a young age, more equitable sharing of household responsibilities, and family planning, all of which would affect the human capital women would have as they enter the market. Although in Becker’s framework, this would lead to inefficiency because there would be less specialization, and thus reduced potential consumption (Becker 1981). However, an increase in freedom and agency for half the population seems worth the cost of complete efficiency.

This model implies, but does not necessitate, free choice on the part of the wife and an altruistic household head that will use his income to maximize the family’s utility. According to this theory, both partners participate in income pooling, and so it makes no difference as to who the primary earner is, as a dollar earned by either partner increases both their incomes by the same amount (Becker, 1985). However, this is an unrealistic assumption, as both have different preferences, and differences in income earning power will create differences in decision-making power.
2.2.c. Consequences of Specialization

A feminist critique (backed by empirical evidence) of Becker’s assumption about the altruism of the head-of-household and income pooling, is that it does not reflect reality for many – if not for most – couples. Each partner will have distinct preferences, and thus would be made better by different spending decisions. The household member that controls the majority of the household earnings will have considerable power over his partner and the household expenditures. This may have negative social, physical, and economic outcomes for women and their children. If a woman’s partner abuses this power, does not have the best interest of his family in mind, or a woman does not have the means to provide for her children and herself on her own, this relationship will involve explicit or implicit coercion, and thus her decisions cannot be considered free choice, especially considering that the male-breadwinner paradigm is deeply embedded in many cultures (Bergmann, 1981).

Findings confirm that complete income pooling is rare and that the wife's income share relative to her husband’s is a significant determinant of the wife's decision-making power in the household. A higher share of income, unsurprisingly, means more decision-making power (Attanasio and Lechene 2002). find that a change in the Child Benefit program in the UK, in which the benefit was given directly to mothers instead of in the form of an income tax deduction, resulted in increased spending on children and women’s clothing relative to men’s: evidence against shared preferences and income pooling (Pollack et al. 1997).

2.2.d. Taste for Discrimination

Individual discriminatory preferences may also contribute to unequal labor market outcomes. The tastes and preferences theory, developed by Gary Becker (1957), models the economic results of employers’, employees’ and customers’ arbitrary biases against certain
workers. Employer distaste makes the prospective hire cost more if they belong to this group because the employer gets disutility in the form of psychic costs from hiring them. Becker conceived his theory to model racial discrimination in the marketplace; however, it is easily transferable to gender discrimination. A male employer may not have distaste for social proximity to women, as they likely know and live with them, but they may dislike employing them into order to enforce what they see as gender appropriate behavior. If employers have distaste for working around women or a preference for working with only men, they will only hire women if the competitive wage, combined with the added perceived cost, is less than the male competitive wage. The increased perceived cost of hiring a female will lead to the employer hiring fewer women. In this model, employers who hire based on these increased perceived costs will hire too few workers, causing a loss in profits. If the market is competitive, according to this theory, the firm will eventually lose out to non-discriminatory firms who can hire more labor at lower wages. This is an irrational behavior on the part of employers that would be punished in the marketplace (Becker, 1957).

2.2.e Statistical Discrimination

The statistical discrimination theory differs from taste-based discrimination; this type of discrimination does not stem from personal prejudice on the part of the employer who is rational and information-seeking. Statistical discrimination theory proposes that employers base hiring decisions on group averages because of imperfect information (Arrow, 1971) (Phelps, 1972). Individuals may receive disparate treatment in regards to hiring based on group memberships (race, gender, sexual orientation, etc.), even if they share identical observable characteristics in every other aspect. Employers see a prospective hire’s race or gender as communicating something less easily observed about their potential productivity in the face of
incomplete information. This disadvantages female and minority workers that are more productive than their group averages. If women often leave work to have a child, then the firm will be less likely to hire another woman, even if she has no intention of having children, in order to avoid the costs of maternity leave or finding a replacement. This type of discrimination will not be weeded out by competition, as in Becker’s framework of discrimination because it may be beneficial for the firm.

Statistical discrimination may increase efficiency compared to an economy where this information is ignored if group averages are a reliable enough gauge of productivity and ascertaining individuals actual productivity is difficult or costly This may be the case in trying to determine whether a prospective hire will leave work to raise his or her child. It can also reduce efficiency if one group has a disproportionately high number of less productive workers that lower the average, despite highly productive workers being equally likely to fall into either group (Schwab, 1986).

Statistical discrimination can also cause inefficiencies if it affects disadvantaged groups’ human capital investments. If statistical discrimination is prevalent enough, women with greater than average productivity will be penalized in the labor market. This will result in reduced incentives for acquiring skills that lead to above-average productivity and cause statistical discrimination to become self-perpetuating. In addition, it may exclude women from occupations that require traits that men on average are more likely to have. An example would be an occupation that requires physical strength. Female individuals possess these traits, but because women, on average, are not as physically strong as men, a firm may be hesitant to hire women because they are uncertain about her potential productivity, and it is difficult to
ascertain strength through a resume. Thus they may rely on deep-seated assumptions about women’s work and men’s work, not realizing that this is discriminatory.

### 2.3 Occupational Segregation

Men and women are distributed unevenly across occupations. Occupational segregation is a concern because it is a critical mechanism in driving the wage gap. It is also inefficient economically because it prevents capable workers’ from entering occupations where they may be more productive than in the jobs currently available to them. Additionally, it relegates women to jobs wherein they perform tasks that mimic housework or mirror gender “appropriate” behavior, leading to the perpetuation of stereotypes. Females are “crowded” into these occupations; the higher the percentage of female workers in an occupation, the lower the wage (Bergmann, 1974)(Hegewisch, Ariane, et al., 2010). As the wage gap shrinks, the role occupational segregation plays increases. In 1980, 27% of the gender wage gap was attributable to locational factors like occupation and industry, this has increased considerably since then; 47% of the gap could be attributed to these factors in 2010 (Blau and Kahn 2016).

Occupational segregation is an ingrained labor market fixture that reflects long-standing values and customs about gender, making its eradication very difficult.

Edward Gross pioneered an approach to quantifying occupational segregation using an index of dissimilarity, which determines the percentage of women that would have to change jobs in order for the number of men and women in an occupation to be the same. He found that the index remained virtually the same from 1900 to 1960, at about 67 %, despite large and continuous increases in women’s labor force participation and dramatic changes in women’s rights (Gross, 1968). This is important to note because the index of dissimilarity today stands at 51%, which is up from 50% in 2002 (Hegewisch et al. 2010). This is not particularly large,
yet one would hope and assume, given changing attitudes about gender norms and women in
the workplace that the index of dissimilarity would decrease over time not grow.

The causes of occupational segregation are complex, deeply rooted, and challenging to
pinpoint, as they have evolved and shifted over time. Occupational segregation likely stems
from a confluence of factors including, biology, gender norms, sexism, tradition, and economic
forces. There are several theories that are useful to understanding the complexities of its
genesis and the continuation of this phenomenon in the labor market today. These theories
work together to illustrate a complete picture of occupational segregation, and can be loosely
grouped into supply side theories (women’s choices in the labor market), demand-side theories
(employer preferences), and political economic theories (the sources of these choices and
preferences).

2.3.a. Supply Side Theories of Occupational Segregation:
Individual Preferences

Supply side theories view occupational segregation as the result of women’s utility
maximizing preferences. Human capital theory can be used to understand how women’s
investments contribute to occupational segregation. Women may foresee intermittent labor
force participation and will choose occupations or fields where their capital investments will
not deteriorate if they take time away from the workforce. Women’s educational attainment
exceeds men’s, however, the type of education they receive can explain some of the vertical
gender gap in within firms and the horizontal gap across occupations and industries.
Educational fields continue to be gender-segregated, with women less likely to be in higher
paying fields that require mathematical skills. In 2004 women constituted only 25 percent of
the STEM workforce (Havemen and Beresford, 2012). Because the capital required for these positions may atrophy or become less relevant in rapidly evolving STEM fields, women may see obtaining degrees in these fields as riskier investments if they plan to leave the labor force for a period of time.

Gender segregation in major and occupation may reflect differences between men and women’s value system, which may determine their preferred career characteristics. A longitudinal analysis of high school seniors’ value orientations along three dimensions: compassion (concern and responsibility for the well-being of others), materialism (emphasis on material benefit and competition), and meaning (concern with finding purpose and meaning in life) revealed substantial and persistent gender differences. In 1977 through 1991, young women were consistently more likely than young men to express concern and responsibility for the well-being of others and describe finding purpose and meaning in life as extremely important, and less likely than young men to accept materialism and competition (values that may lead to greater economic success). These findings showed no indication of converging over time. However, men and women did not differ in their prioritization of income (Beutel and Marini, 1995).

Another possible interpretation of Marini’s findings, is that young men and women may differ in their expressed values because they associate their imagined futures with different values, traits, and gender connotations, which they emulate in preparation for their adult lives. In another study, once career attainment, education, age, children, and marriage were controlled for, gender differences in values were no longer significant (Rowe and Snizek, 1995). It follows from this that people’s values may line up with their career attainments and education, although the evidence is inconclusive. Supporting this theory, a study of female finance
executives found that the most successful of them had attitudes toward work that were virtually identical to those of their male counterparts (Blair-Loy, 2003). This suggests that women’s attitudes about work may partially determine their career attainment.

### 2.3.b Demand-Side Theories of Occupational Segregation:

**Labor Market Segmentation and Discrimination**

Demand-side theories see occupational segregation as a phenomenon caused by employers differing demand for women across different occupations, resulting in lower pay in female dominated occupations. Because the demand-side taste for discrimination has not yet been weeded out as Becker’s theory predicted, orthodox economic models, which are static, and view history, beliefs, and attitudes as exogenous, may be insufficient to capture a phenomenon as complex as discrimination. For this reason, I will focus my attention to political economic approaches, such as structuralism and institutionalism, which acknowledge the interplay between economic and cultural forces.

Labor market segmentation is a demand side approach, which challenges the neoclassical assumption that all agents participate in the same labor market. The dual market theory, a more specific version of labor market segmentation, understands the labor market as being divided into two sectors: primary and secondary. Jobs in the primary sector offer high pay, upward mobility, and better benefits and working conditions, while jobs in the secondary sector are lower paying, have worse conditions, and less job security. Those in the secondary sector are excluded from the primary sector, thus inflating the wages in the primary sector while deflating wages in the secondary sector due to an oversupply of labor (Bergmann, 1974). This dual-market assumption expands on theories of institutional and structural discrimination.
Examples of secondary sector jobs that women are crowded into include child care, food service, and retail. Women disproportionately work in the secondary sector (Reich, Gordon, and Edwards, 1973). Embedded social institutions cause this crowding. They will affect what employers’ beliefs about the positions women will be best suited for and how productive they will be in them. This thus affects their entry into occupations and their level within them. If employers believe that women are more likely to take time off, have higher absentee rates, and greater turnover, they will be less likely to hire them. They also may see women as lacking certain traits that they equate with high-productivity or success in the labor market, which would make sense if the highly productive people the employer knew were other men. These factors arise as structural barriers for women’s entry into the primary sector, resulting in lower wages (Prasch, 2008)(Bergmann, 1974).

Discrimination against women is ingrained in many customs and institutions that affect women in the labor market. Discrimination need not be intentional in order to have a negative effect on women’s occupational distribution or income. Discriminatory behavior by individual firms is unlikely to be weeded out, as Becker’s model theorizes, if “tastes” are pervasive in male-dominated, or primary sector, firms. Statistical discrimination may also hide more insidious forms of prejudice that are embedded in institutions, and thus are not rational responses.

Employers may view women as being less productive based on stereotypes, “common knowledge”, or enabling myths that fall under the Veblenian umbrella of “ceremonial behavior”, which slows progress, broadly encompassed by the category “technology”, but this can be extended to new ideas that emerge and overtake old theories. Many employers may do this without realizing that they are perpetuating discrimination. are institutions, not individuals,
they perpetuate and incentivize discriminatory beliefs and attitudes. Institutions, in this framework, are the “correct” behaviors and attitudes, which are based in tradition, and thus more difficult to eradicate; they can be self-perpetuating and lead to path dependency. Structures, or institutions in the more popular sense of the term (i.e., business, government, policy, and education system) may simultaneously reflect back what society perceives to be the “correct” behavior and attitudes. This has the power to naturalize discrimination and penalize firms that do not mirror widely-held attitudes, making affecting change a slower process. These institutions form hierarchies that those with the most power will strive to maintain, such as is the case with white male employees in the primary sector who benefit from discriminating against other groups (Albelda and Drago 1997).

Gendered divisions of labor are not easily eradicated even when occupations are desegregated. Bielby and Baron find that when they study individual establishments more closely, even workers who are in occupations that are not segregated by sex, job-title segregation was almost complete--at an index of dissimilarity of 96%. They found that small differences in job requirements led to large differences in gender composition. Employers viewed some jobs as either “inappropriate for women or appropriate only for women”, even if there was considerable overlap in the skills of male and female employees (Bielby and Baron 1986). Reskin and Ross find that in occupations that are increasingly hiring women, women and men work in different subspecialties, for different clients within firms, in different industrial sectors, and at different ranks. Men retain more desirable jobs while women are disproportionately relegated to positions with lower-status, less desirable work settings, lower pay, and part-time rather than full-time work, in keeping with the occupational crowding model (Reskin and Ross 1990) (Bergman 1974).
2.3.c Supply and Demand

Neoclassical economists see occupational segregation as the result of women and employer’s rational choices. The compensating differentials theory posits that women choose jobs that provide substantial enough benefits that they are willing to forgo a higher pecuniary wage. These benefits may include safe conditions, flexible hours, child care, and health care coverage. They then will match with firms offering this package of benefits and wages that suit them best. If compensating differentials are the reason that predominantly female occupations command lower wages, then there is no need for policy changes, as doing so would only create inefficiencies in the market. Neoclassical theories are, however, predicated on choice, and so when accessing the applicability of these models it is important to question what degree of choice the agents actually have and to look for what mechanisms may be constraining them. To do this requires historical analysis of women’s work.

2.4 The Recent History of Occupational Segregation

Examining the historical and social forces at play as women entered the labor force sheds light on the origins of occupational segregation in the labor market and provides evidence that occupational segregation is, contrarily, the result of women’s historical lack of choice. Gender roles became more sharply defined during the Victorian era. They strictly dictated how men and women acted, worked, and socialized, and were rooted in essentialist beliefs about the nature of each sex. Men were smarter and stronger than women, while women were more orderly and morally pure. These roles, combined with drastic economic changes during the industrial revolution, namely the development of a sharp division between home and market production, led to men working in paid labor while women stayed at home caring for children.
and tending to non-market responsibilities in the domestic sphere. The male-breadwinner female-homemaker ideal was created, cementing notions of what qualities constituted man and womanhood. A man’s success was tied to his work ethic and earning capacity and a woman’s to her ability to care for her family (Hughes 2016)(Figart et al. 2003).

In the 20th century, women entered the labor market as opportunities for female employment increased; however, the positions they entered created “female” jobs that remain as such today. Women’s labor force participation stayed steady until World War II, when wartime labor shortages necessitated women’s entry into the workforce, with many women continuing to participate in paid work post-war even though it was no longer their patriotic duty to do so. World War II marks the beginning of women’s inpouring into the labor market. As women’s labor force participation was growing in the 20th century, only certain jobs were available or desirable to women after men returned and reentered manufacturing jobs. Despite an influx of women into the market, the occupations available were limited to “women-friendly” ones. Many of these positions were service sector jobs, non-unionized manufacturing jobs, or “pink-collar” professional jobs. Positions that were once the domain of men became available to women, as the demand for service sector jobs increased; although the “feminization” of these careers led to lower pay (Figart, Mutari and Power, 2003). Fields such as education, clerical work, sales, nursing and human resources are now overwhelmingly composed of women. Women have increasingly entered into management positions, which command higher wages although the rank and responsibilities of these management positions, and thus their pay, are not the same as those held by men (Goldin, 2006).
2.6 The Glass Ceiling

The popular expression “the glass ceiling” describes the vertical dimension of occupational segregation. David Cotter, et al. establish four criteria that must be met to conclude that a glass ceiling exists. Glass ceiling-type inequality represents: (1.) "a gender or racial difference that is not explained by other job-relevant characteristics of the employee"; (2.) "a gender or racial difference that is greater at higher levels of an outcome than at lower levels of an outcome"; (3.) "a gender or racial inequality in the chances of advancement into higher levels, not merely the proportions of each gender or race currently at those higher levels"; and (4.)"A gender or racial inequality that increases over the course of a career (2001). These four criteria are useful for understanding this familiar phrase, in order to study it in economic terms.

Occupational segregation manifests itself both vertically and horizontally. Vertical segregation or job-level segregation refers to where women sit within the hierarchy of an organization. This dimension of segregation captures some of the differences in promotional practices within firms, which disproportionately negatively affect women. Pay generally increases through one’s career, in tandem with increased responsibility and understanding; however, fewer women are given leadership roles than men, and when they are, they often encounter a larger pay gap relative to their male coworkers, even when factors like job type, experience, education, etc. are controlled for. This is consistent with evidence that occupational segregation may penalize women with high incomes more than those with low ones (Albrecht, et al. 2003)(Ariane, et al, 2010).
Women are underrepresented at the top of the corporate ladder. Currently, only 27 CEOs in the Fortune 1000 are female, only 35% of the executives (Vice Presidents and above) are female, and the uncontrolled median salary of a female executive is 32.8 percent less than that of male executives. When controls are added for location, experience, and education, the gender pay gap shrinks to 6.1%, due to the fact that they are more likely to work at smaller companies and in non-senior executive leadership roles (“Women in Leadership” 2015)

2.6.a. The Negotiation Divide

The negotiating divide hypothesis may explain a considerable portion of job-level segregation and the wage gap between male and female workers in the primary sector. Babcock and Laschever observe very large differences in men and women’s willingness to negotiate for themselves. Babcock observed that male’s from Carnegie Mellon’s graduate school earned starting salaries that were 7.6%, higher on average than those of female MBAs from the same program, and found that it was because only 7% of females, but 57% of males, had attempted to negotiate up from an employer’s initial salary offer, prompting further research into this phenomenon. In an experiment they conducted, they offered students between $3 and $10 compensation for playing a game of boggle. All students were paid $3 unless they asked for more; eight times as many men asked for more money. Babcock and Laschever saw this as indicative of differences in the way women and men are brought up (2003).

Babcock and Laschever theorized that this divide reflected a fundamental underlying difference in women’s conception of their agency and developed what they called, “the turnip to oyster scale”, which measured “people’s propensity to see possibilities for change in their circumstances” (22). They found that 45% more women had low scores and that these low
scores correlated significantly with reduced negotiating. Failure to negotiate not only affects wages, but also the likelihood of receiving promotions, improving working conditions, and having the freedom of a flexible work schedule. The negotiating divide should not be blamed on the women who don’t ask. Women who do, often receive less and are more likely to be perceived as pushy or worse, making negotiating a less rewarding and more unpleasant experience, which makes them more likely not to pursue further negotiations (Babcock and Laschever, 2003).

This finding challenges the popular idea of “leaning in”; the solution to women’s work issues is to be more assertive, thus acting in a more masculine way in order to have one’s opinions heard (Sandberg 2013). Not allowing one’s self to be constrained by assigned gender roles is a positive step toward equality for women, but this position oversimplifies the issue, and puts the onus on women to fix gender discrimination. Ingrained gender norms have created stereotypes that affect men’s views and behavior about women. Men have learned to objectify women; additionally, while learning about behaviors expected of them as men, they are taught not to be like women, and face bullying or discrimination if they are. There is much disagreement and speculation about the origins of gender roles, but many theorize that these behaviors are the result of thousands of years of human history.
Section 3: Gender Roles and Non-cognitive Traits

Gendered Socialization

3.1 Gender vs. Sex

In the words of Simone de Beauvoir, “one is not born, but rather becomes, a woman”. This notion is critical for understanding current differences between genders. In western society, the terms gender and sex, man and male, and woman and female are often used interchangeably; however, doing so is incorrect, as each term carries a specific meaning. When discussing the different obstacles that genders face as a result of their gender roles, it is necessary to distinguish between gender and sex, as most of the differences between the ways men and women behave are taught, not bestowed on them at birth. Equating sex and gender risks suggesting that the observed differences in the way that men and women act are a result of biology, and thus fixed, and not the result of complex and dynamic processes that create the gender binary.

One’s sex is generally thought to be biologically determined at birth; however, this definition is being reconsidered, as those who have gone through gender reassignment processes are considered there physical, though not original, sex. Physical attributes such as external genitalia, sex chromosomes, sex hormones, and internal reproductive structures, determine that a child is either male or female. Gender identity is one’s internal sense of self as male, female, both or neither. Gender is created by the interrelationship between sex and social perceptions of what attributes, outward presentations and behaviors that each sex is expected to display. Typically, society perceives males or females as a man or woman, respectively, where man and woman are social terms with associated cultural expectations attached. The
prescriptive behaviors that society assigns to each gender create gender roles. These are reinforced through socialization by which individuals learn to differentiate between what society regards as acceptable versus unacceptable behavior in order to act appropriately in society (Diamond, 2002).

A sex-based divide in the roles of males and females is nearly ubiquitous. This seems to provide evidence for theories that view biology as the cause of modern day gender differences in presentation, preferences, attitudes and affects. However, the behaviors and expectations that these roles entail vary across time and between cultures which suggest that much of gendered behavior is not rooted in the biological essence of each sex, but is socially constructed (McGivern et al. 2014).

3.2 Social Role Theory

The Evolution of Gender Roles

Eagly’s social role theory explains the process through which gender formed through socialization in a patriarchal society that stems from the historical division of labor (1987). This theory runs counter to the evolutionary psychology approach which sees sex differences as intrinsic characteristics that evolved in humans to ensure their survival and maximize their reproductive success. Eagly's social role theory posits that biological differences (male’s physical size and women’s ability to bear children) created a division of labor in primeval societies, when these differences were more salient. The different nature of these innate physical endowments did not likely create status differences, simply division until technological developments arose and interacted with these differences. The timing and specific origins of the patriarchal society are debated, Eagly’s theory fits into the social
functionalist perspective in sociological fields, which see the arisal of agricultural societies as a turning point (McGivern et al. 2014).

The Marxist view of gender relations take a historical approach to understand how these relationships changed throughout time. This view sees women’s oppression as stemming from men’s control over the means of production. In hunter-gatherer societies, a community was formed by interrelations among the people, not strict family structures, this gave women significant power, as children “belonged” to women, not men, as paternity could not be verified. Agricultural society shifted power to men, who were better able to use tools requiring physical strength. Once the notion of individual ownership of land and property became more common, issues of lineage became more important, and monogamous coupling became the norm. Because men were only willing to pass on ownership to their legitimate children, monogamy, and thus reproductive control of women, became accepted, and pervasive. Children were no longer the domain of women; both women and children were now part of men’s “property”. Children also became economic assets, commodifying reproduction. Men were now property owners who had created a system of women’s dependence (Engels 1884).

Women and men still often worked side by side to produce the household goods that the family needed throughout much of history. However, as society progressed, and paid labor outside the home became the means of providing for one’s family, the sexual division of labor became more pronounced, and women became confined to the home while the outside world was the domain of men. This gave men new opportunities to gain wealth, creating sex differences in status that favored men. In order to justify men’s dominance, essentialist notions of gender developed and perpetuated the myths that women were inherently less competent, brave, and rational, thus ill-suited to independence. These enabling myths were effective, as
they were based in semi-accurate observations of human behavior, while ignoring their role in creating this behavior in the first place (women are less intelligent, therefore they shouldn’t be educated vs. women are less intelligent because they are uneducated). The notion of each gender possessing specific personality traits may have created a feedback effect that perpetuates these characteristics (Eagly 1987) (Wood and Eagly 1999) These personality traits include high self-esteem, low risk aversion, and internal focus in men, and lower self-esteem, high risk aversion, and external focus in women became personality traits that were so ingrained that it was difficult to tell whether or not their origins were genetic or social. This gender hierarchy persists today even though postindustrial societies no longer face the same obstacles as those in earlier ones, such as the need to hunt for food and breastfeed for long periods of time. This division of labor has created roles for each gender that benefit males disproportionately.

The division of labor, ensuing status hierarchy, and myths perpetuated by the patriarchy about women and men’s “true natures” created traits associated with each sex role; these traits then became the foundations for conceptions of femininity and masculinity. Femininity and masculinity are umbrella terms that cover a myriad of gendered, dichotomous, traits. Men’s accommodation to roles with greater power and status produced dominant behaviors of control, aggressiveness, and individualism, as these traits, aided the aim of gaining more power and status. Women’s accommodation to roles with less status produced subordinate behaviors of cooperation, compliance, and nurturing; these traits are helpful for raising children, and are often viewed as more positive characteristics for society, although limiting for the individual. Men benefited from being the receivers of women’s nurturance and compliance and from their own freedom and wealth, while women may benefit from men’s wealth, they are neither given
the power to accrue their own nor are they the recipients of nurturance and affection from their partners. These sex typed behaviors associated with men, Eagly calls agentic, and the behaviors associated with women, she calls communal. The traits associated with each sex role are closely linked to gender stereotypes, which are overgeneralizations based on the social role that one plays. This translates into current individual behavior when society endorses these stereotypes through incorporating physical appearance, occupations, and mannerisms into these roles, which are internalized from a young age (Eagly 1987).

3.3 Gender Schema Theory

Psychologist Sandra Bem’s influential gender schema theory suggests that cultural influences are responsible for how children develop their ideas about what it means to be a man or woman (Bem 1981). A schema is a psychological framework that connects and categorizes new information using existing ideas and knowledge. Schemata play a role in parsing out unimportant stimuli from important stimuli, so only the important stimuli is absorbed and retained. This has the effect of making people more likely to pay attention to and remember things that fit into their schemata. These schemata are also responsible for people’s confirmation biases; often, people interpret contradictions to the schemata as exceptions or distort them to fit in with their preconceptions. According to theory, schemata are formed early and are resistant to change because this natural mental networking is very important to navigating a complex environment.; albeit some are more useful than others, and some may actually be a hindrance. Schemata generally serve a useful purpose; by connecting stimuli, memories, ideas, and emotions, people are better at retaining information and filtering out material that may be distracting or unimportant (Piaget 1952).
One’s gender schema will sort stimuli and information into binary categories based on preexisting knowledge and assumptions about gender, leading to an easier ability to assimilate information that is stereotype congruent, hence further solidifying the existence of gender stereotypes. Once children develop a gender schema, their identity becomes interlaced with expectations because of their gender, leading to the regulation of behaviors that conform to the cultural definition of what it means to be male or female. This is called self-socialization. This process is strengthened by peers, parents, media, and teachers. Hence, a child with parents who model stricter gender roles (mother as homemaker and father as breadwinner), and who themselves have a more defined gender schemata, will likely also develop a defined gender schemata. They also may be taught that this gender distinction is accompanied by distinctions between power and status in men and women, known as the gender order. It has been shown that people of all ages who conform more to presentations and behaviors within the gender binary will more readily process stimuli according to gender lines (Bem 1981). This is contrasted with those who fall into Bem’s “undifferentiated” and “androgynous” categories in her sex role inventory. Undifferentiated types are, those who, do not possess many strongly sex-typed characteristics or behaviors, while androgynous types equally adopt masculine and feminine characteristics and behaviors (Bem 1974). In her studies, those who fall outside the masculine-feminine spectrum are more likely to use more relevant and useful groupings, such as semantic meaning. An example of this would be, say, associating the words butterfly with pink and eagle with blue instead of using the categories “animals” and “colors”. This suggests that stricter gender schemata may hinder ways that the brain processes information, and that children may benefit from reduced exposure to arbitrary gender divisions (Bem 1981).
The socialization of gender begins at birth. Developmental psychologists Zosuls et al., find that 68% of children used gender labels, such as boy, girl, man, woman etc. by 21 months old. These labeling results were used to predict changes in gender-typed behavior with the two most strongly gender-typed toys (trucks and dolls). Children who knew and used gender labels were more likely than other children to show increases in gender-typed play with toys. Thus, knowing basic gender information is related to acting in gendered ways, evidence of a positive feedback loop (Zosuls, et al. 2009). There are several theories, both conflicting and compatible, that seek to elucidate the specific processes through which gender is learned. The processes through which children learn gender include identifying with the same-sex parent, a system of punishments and rewards for acting in accordance with or deviating from gender norms, and self-socialization once a gender schema has been established.

Children are taught gender by parents, peers, teachers, and forms of media. A child in a household with heterosexual parents will learn early on which parent is the “correct” one to model their behavior on. If her parents display traditional heteronormative behaviors and appearances, she will not only associate “mom”, “woman”, and “girl, but may also associate things such as “dress”, “kitchen”, and “pretty” into her idea of how she should act as a girl. She may associate things such as “work” and “strong” with her father, and thus with males in general. Parents may enforce this directly, through telling their child that they are acting wrong when deviating from their gender’s behavior, or indirectly such as buying them gender typed toys. Gender typed toys epitomize arbitrary, often detrimental, ways boys and girls are divided as children. Boy’s toys emphasize active, first person play, and often are related to “male” careers. Examples of this are trucks, Legos, and play guns. Girl’s toys nearly always involve mirroring homemaker tasks (toy kitchen, toy oven, baby dolls) or emphasize attractiveness
Moreover, the toys rated as most likely to be educational and to develop children’s physical, cognitive, artistic, and other skills were typically categorized as neutral or moderately masculine (NAEYC, 2017). This may shape early development unequally and create artificial barriers between children, segregating them by sex, which will strengthen divisions between them and enforce these roles.

Gender inequality is unique among other types of between-group inequality, as survival necessitates integration and dependence between genders. Gender roles are thus especially salient in shaping romantic relationships and family structures. Growing up, children also are told that those who either were an extremely masculine male or feminine female were the most attractive, superhero and princess movies, for example. This leads to associating strength, heroism, risky behavior and self-reliance with male attractiveness and beauty and distress with female attractiveness. Sandra Bem calls this the heterosexual subschema (Bem 1981). This reproduces gender distinctions by teaching that men and women are different. This makes many interactions with people of the opposite gender focused on sex; strongly masculine or feminine participants were much likely to change their behavior towards the opposite sex depending on their attractiveness (Martin 1995).

Prescriptive notions of normative gender behavior have fundamentally altered the structure of the economy and household. Gender roles shape women’s economic outcomes both directly and indirectly. In feminist economics, inequality is thought to be the result of social constraints from organizational or governmental policies and structures that favor men and other’s attitudes and treatment of women. However, Paula England theorizes that there is second additional mechanism causing unequal outcomes. She believes early socialization and later constraints shape identities, beliefs, and values, which affect personal characteristics that,
in turn, affect outcomes (England, 2016). Because occupational segregation may be a manifestation of societal ideas of what males and females should occupy themselves with, observing the intersection of socialized gender roles and labor market outcomes is imperative for understanding economic inequities.

Socially created gender roles have shaped male and female personality traits to affect labor market decisions and their outcomes. Women’s relatively recent entry into the labor market compounded by the biological “role” bestowed on them by a patriarchal social structure has left women, on average, with skills, preferences, and dispositions that diminish their agency and hinder economic success. Men’s historical hegemony has resulted in men, on average, possessing traits that emphasize agency, dominance, and individualism, which correlate with more favorable labor market outcomes. These traits are linked to assessments that measure locus of control, self-esteem, and risk aversion, which have been shown to affect economic outcomes. These benefits are amplified by existing occupational segregation. This is because men benefit by sustaining male dominance. These elevated roles are sustained through a work culture that rewards these traits and nepotism in hiring practices.
Section 4: Non-cognitive Traits, Gender, and the Workplace

There are several mechanisms through which non-cognitive traits may affect economic outcomes. I separate these into two overarching frameworks: a neoclassical framework and a political economy framework. The neoclassical explanation is that non-cognitive skills are productive characteristics that are reflected in wages, just as schooling, training, and experience are. The political economy one, informed by sociological takes the approach that non-cognitive skills shape interactions between workers. This approach is especially salient in explaining occupational attainment in firms that necessitate interaction with colleagues, working as a team, and have promotional opportunities determined by subjective performance reviews. The results of the empirical tests may illuminate which one is a more likely cause of unequal outcomes, although, they are not mutually exclusive.

If returns to non-cognitive skills are the same for men and women with the same measures of these skills, the human capital model may better explain gender differences between traits; women make less because they do not have certain productive characteristics. This does not rule out the effects of gendered socialization contributing to inequality, as it is possible that women are not encouraged to have these traits from a young age, which is a disadvantage in the labor market. It could also be the case that male traits are falsely equated with productivity and are thus overvalued due to men’s historical domain over the professional world, but that the return on these traits contemporarily is not gender specific.
Those subscribing to a political economy framework may view non-cognitive traits as causing economic outcomes through differences in how these traits are interpreted by an in-group in a work environment. This view would be supported by a result showing differing returns to non-cognitive traits, indicating that these traits are valued differently depending on whether or not the holder of them is a man or woman.

4.1 Social Identity Theory

Social identity theory posits that people have higher self-esteem when they belong to an in-group. People will thus ascribe better characteristics to those in the same group as that improves one’s own self-image. Those in an in-group tend to exhibit positive attitudes and supportive behavior toward others in the group, in part to due to in-group loyalty, and . In a work environment, these characteristics may include competence, leadership ability, and work effort, and those in charge may reward those in their “in-group” more than those who are not. In many professional environments, this grouping will likely have the form of men as insiders, women as outsiders based on differences in status and the larger number of men. Competition will exacerbate this, as numbers of the out-group increase, as those in the in-group may feel threatened and further cement their affiliation with their group (Tajfel 1979).

Categorization of people into social groups increases the perception that group members are similar to one another, which may make men perceive individual women to be more different from them than they are in actuality; there’s much more variation within genders than between genders. Due to group identities, they may assign women characteristics that are more aligned with stereotypes instead of their given traits. This is the out-group
homogeneity effect, and it is compounded by the effect of low status because people in Western societies equate individuality with high status, regardless of group membership (Snyder & Fromkin, 1980). This refers to the perception of members of an out-group as being homogenous, while members of one's in-group are perceived as being diverse. In-groups are determined by composition ratios, or how many people of each group are in the respective population, as well as by status. According to this theory, if men have higher returns to productive characteristics, it may be that individual differences in productive traits are valued more in men, while women are lumped together, and thus their skills are not seen individually. It may also be that men would prefer to see women as aligning with out-group characteristics, especially as female traits are seen as both positive and nonthreatening, and will penalize them for acting outside their role (Tolbert, Graham, and Andrews, 1999).

4.2 Non-Cognitive Traits as Human Capital

Those subscribing to a neoclassical would see non-cognitive traits as skills that translate to productivity are thus rewarded by a firm through wages and promotions; they are an, oft unobserved component of a worker’s human capital. Human capital plays a central role in models of economic outcomes (Mincer 1974). In empirical models, education is often used to proxy human capital; however, this measure fails to capture, at least directly, many other productive characteristics a worker has, such as their set of non-cognitive skills (Lundberg 2015). Bowles and Gintis argue in several works that schooling increases non-cognitive skills, which make a worker more attractive to an employer and thus command higher wages (Bowles and Gintis 1998)(Bowles et. al. 2001).
Others find that non-cognitive traits determine the quantity of schooling one accumulates; if one’s traits extend his or her time-preference or make the less academic, but crucial, organizational and social demands of school more manageable they will have a lower opportunity cost of education because it is less psychically expensive compared to those without such abilities (Heckman et al. 2006); these productive skills parallel the non-cognitive traits locus of control, which is theorized to affect motivation, effort, and delayed gratification. This concept—that educational attainment reflects less observable abilities—is pursuant to Spence’s signaling model of education. This theory sees school as a signal to employers that a worker is productive enough that he or she was able to manage the demands of higher education, and thus will have an easier time than less educated workers adapting to the demands of their firm, making them a more attractive employee (Spence 1973).

Almlund et al. find, that for many outcomes, non-cognitive skills are as important as cognitive skills (2011). Cognitive characteristics, such as IQ, have been used to flesh out measurements of human capital with meaningful results, which is sensical; intelligence has a clear relationship to educational achievement and productivity. Evidence has grown that non-cognitive skills have large and significant impacts on individual earnings and other economic outcomes through their effect on effort (Heckman, et al. 2006). Work effort, which should increase productivity, reflects motivation, which is governed in part by personality factors (Rotter 1966).

**Locus of Control, Self-esteem, and Risk Tolerance**

Individuals with an external locus of control who believe that hard work and effort will not be rewarded are less likely to display high levels of effort on the job (Ng, et al. 2006).
Self-esteem has been found to be a strong predictor of job performance, as those with high self-esteem will see themselves as being more capable of completing difficult tasks, tend to be more confident about making decisions, and will use their time more effectively and more productively (Judge and Bono 2001). Those who are risk averse will be less likely to accept challenges that may have negative consequences if one is unsuccessful. It has been shown experimentally that among males, but not females, there is a significant difference in risk-aversion between those who assume leadership roles and those who prefer not to (Ertac and Gurdal 2010).

Internal locus of control has been linked with higher earnings (Semykina and Linz 2007) (Osborne Groves 2005) (Osborne 2000). It has also been linked to occupational attainment (Cobb-Clark and Tan 2011) shorter returns to work after pregnancy (Berger and Haywood 2016) and less persuadability (Avtgis 1998). Semykina and Linz (2007) find a positive association between the locus of control and wages of Russian women, though not for Russian men. In contrast, Cobb-Clark and Tan (2011) find that women’s occupational attainment is not linked to their locus of control, while men with an external locus of control are less likely to be managers or education professions and are more likely to be employed as cleaners or factory workers.

Locus of control measures how much agency to change one’s situation one feels they have. Someone with an external locus of control may allow their circumstances to control their life instead of feeling like they control their circumstances. This affects how people respond to reinforcement of their behaviors. For example, if someone with more internal control is accepted for a job, they perceive a more direct link between their own ability and work ethic and the job acceptance. Whereas, someone in the same situation with more external control
may perceive the acceptance as being the result of luck, assuming that other, just as qualified, people were not accepted. Therefore, the one with internal control may focus doing the things that they see as leading to the job acceptance, or positive reinforcement, as they expect to be rewarded again, while the one with external control may not exhibit the same focus, as they don’t believe their actions will likely be met with another positive response. This is true for negative reinforcement as well (Rotter 1966).

High self-esteem has been shown repeatedly to improve general and economic outcomes. Drago (2008) uses the NLSY to test the effect of self-esteem on earnings. His research differs from others that test the same hypothesis, as using the NLSY allows for self-esteem to be included exogenously from earnings because it was measured for the cohort before they entered the labor market. He finds a significant self-esteem premium of 3.7%, which remains when controls for AFQT score (cognitive skills), education, socioeconomic factors and height and weight are added. However, only white men were looked at in this study.
Section 5: Data and Methodology

5.1 Data

To measure the effects of non-cognitive traits on the likelihood of holding a management position, I use data from the National Longitudinal Survey of Youth (NLSY79). The NLSY79 is advantageous, as it collects detailed information on schooling, labor market experiences, family background, location characteristics, and cognitive and non-cognitive test scores. The NLSY79 is a nationally representative sample of 12,686 young men and women who were born between January 1, 1957, and December 31, 1964, and thus were 14-22 years old when they were first surveyed in 1979. These individuals were interviewed annually face-to-face or, less often, in telephone interviews through 1994 and since have been interviewed biennially. Respondents now reside in each of the 50 States and the District of Columbia, U.S. territories, and other countries. Funding to collect data on labor market experiences, human capital investments such as education and training, and information that affects or is affected by labor market behaviors is through the U.S. Bureau of Labor Statistics (BLS), while a variety of other organizations have provided funding for specific areas of interest. The National Opinion Research Center, affiliated with the University of Chicago, is responsible for gathering and managing the data used (NLSY79).

I use observations for labor market characteristics from the 2010 wave of interviews, when the respondents were 45-53 years of age. From the 1979 wave to the 2010 wave the sample decreased by 40%. The 40% decrease was caused by 5,121 respondents who can no longer be interviewed. Of these 5,121, 573 are deceased, 1,151 refuse to be interviewed, 372
cannot be located, 164 have been deemed “difficult cases”, and 141 who are no longer in the sample for other reasons. Making up the remainder of this difference are 1,643 non-black, non-Hispanic, members of an economically disadvantaged supplemental sample and 1,079 members of a military subsample who were dropped. The 2010 round has interviews from 7,565 respondents (NLSY79).

Missing values in the NLSY79 are coded with negative numbers to indicate that the variable does not contain useful information. The five values are (-1) refusal, (-2) don't know, (-3) invalid skip, (-4) valid skip, and (-5) non-interview. (NLSY79). After excluding missing values, the sample has 5,720 respondents.

Management

Management status is the dependent variable in this analysis. Manager is a dummy variable where 0=not manager, 1=manager. 680 respondents are managers, or 11% of the sample. When grouped by gender, 12% of male respondents are managers and 9% of females are. The NLSY79 classifies respondents’ occupations using the 2000 U.S Census codes, which range from 10 to 9990. A value of 1 is used to indicate the respondent having an occupation coded between 10 and 430, which are the values assigned to managerial jobs in the census. A value of 0 is given for all other occupation. I will be using the 2010 observation.

Locus of Control

The Rotter Internal-External Locus of Control Scale was first measured in 1979. Measures of locus of control are created using a four-item abbreviated version of a 23-item forced choice questionnaire adapted from the 60-item Rotter Adult I-E scale developed by Rotter (1966). This data was collected in the 1979 round of the NLSY79. The scale was
designed to measure the extent to which individuals believe they have control over their lives through self-motivation or self-determination, displaying internal control, sometimes referred to as “internality”, as opposed to the extent that individuals believe the environment (that is, chance, fate, luck) controls their lives, this is external control, or “externality”. The scale is scored in the external direction—the higher the score, the more external the individual. The Rotter scale is scored in the NLSY79, by generating a four-point scale for each of the paired items and then summing the scores. For example, the first pair has the following two statements:

1. What happens to me is my own doing. (internal control item)
2. Sometimes I feel that I don't have enough control over the direction my life is taking. (external control item)

Respondents were asked to select one of each of the paired statements and decide if the selected statement was much closer or slightly closer to their opinion of themselves. The following shows how the scale is constructed:

Table 1: NLSY Locus of Control Scale

<table>
<thead>
<tr>
<th>Internal Control Item</th>
<th>External Control Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much closer</td>
<td>Slightly closer</td>
</tr>
<tr>
<td>Slightly closer</td>
<td>Much closer</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
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<tr>
<td>3</td>
<td>4</td>
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</tbody>
</table>

1 2 3 4
Each of the four paired items is constructed in the same manner as the above example. The values for each item are then summed. The maximum possible score is 16, indicating high external control, while the minimum possible score is four, indicating high internal control (NLSY79 Appendix 21: Attitudinal Scales). The mean value for locus of control for the sample is 8.72. For males the mean value is 8.65 and for women it is 8.80. This difference is small, but, according to the t-test, this difference is significant (p=.012). The mean locus of control for managers is 8.18, while the mean locus of control for non-managers is 8.79. These results are also significant (p=.0000)

**Self-esteem**

The Rosenberg Self-Esteem Scale measures self-esteem using a 10-item scale. It was administered during the 1980, 1987, and 2006 interviews. This 10-item scale, designed for adolescents and adults, measures the self-evaluation that an individual makes and customarily maintains. It describes a degree of approval or disapproval toward oneself (Rosenberg, 1965). The scale is short, widely used, and has accumulated evidence of validity and reliability. It contains 10 statements of self-approval and disapproval with which respondents are asked to strongly agree, agree, disagree, or strongly disagree. Questions are answered on a scale ranging from 0 (strongly disagree) to 3 (strongly agree). Examples of the questions asked are: “I am satisfied with myself” and “I am able to do things as well as most other people.” The total score on this measure could range from 0 to 30 points, but the sample minimum is 6.. (NLSY79 Appendix 21: Attitudinal Scales). The average self-esteem for the sample is 22.32. Men have a mean self-esteem score of 22.51, while women have one of 22.14. These means are significantly different at the 0.000% level. The difference for managers and non-managers is more pronounced. Managers have a mean self-esteem score of
23.81 while the non-managerial part of the sample has a mean self-esteem score of 22.15. This difference is also significant at the 0.000% level.

**Risk**

The measure I use to represent risk aversion (tolerance) is a self-reported ranking of risk aversion ranked from 1 to 10. The respondents were asked: “Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? A response of 1 indicated that they ”try to avoid taking risks” and a response of 10 indicated they were ”fully prepared to take risks.” Risk was also measured with the same scale in specific areas: while driving, in financial matters, in occupation, with health, in one’s faith with other people, in making major life changes, in romantic relationships, and in making bets (NLSY79 Appendix 21: Attitudinal Scales). These were measured using the same questions and ranking system as the general scale. Lottery-type questions are also asked in the NLSY79, but according to Dohmen et. al., self-reported rankings are more predictive of risk taking behavior (2007). The mean score for the sample as a whole is 4.84. In keeping with my hypothesis, men and women, and managers and non-managers also differ significantly on measures of risk. Men have a mean risk score of 5.20, and women have a mean risk score of 4.50. Managers have a mean risk tolerance of 5.38, and non-managers have one of 4.76. Both the means for women and men, and managers and non-managers are significantly different (p=0.000)

**Female**

Sex is a dummy variable labeled “female”, 0=male 1=female. The sample includes 2,786 men and 2,934 women, or 48.8% and 51.1% respectively. Women and men’s mean non-cognitive skills and manager status differ statistically significantly; the mean scores and significance
levels can be seen above or in table 2. The sex of respondents was recorded in 1979, during the 1st round of interviews.

**Education**

Education is measured using the highest grade of schooling completed. The values this measure takes on are 0 to 20 where 0=kindergarten or less and 20=8 years of college or more. Men have less education on average by a statistically significant (p=.000) but small amount. The sample as a whole has a mean education of 13.47. Men have a mean education of 13.29 and women have a mean education of 13.63. These values represent more than one year of college, but less than two. This measurement was taken in 2010.

**AFQT**

The variable AFQT is measured using the percentile rank of the respondent score on the American Armed Forces Qualification Test (AFQT), so all values fall in the range 1-99. The AFQT is meant to control for the effect of cognitive skills on outcomes. It is a general measure of trainability and a primary criterion of eligibility for service in the armed forces, and has shown to be more predictive of outcomes than grades or IQ (Almlund, Mathilde, et al 2011). This test is a battery of 10 tests in: general science, arithmetic reasoning, word knowledge, paragraph comprehension, numerical operations, coding speed, auto and shop information, mathematics knowledge, mechanical comprehension, electronics information (NLSY79). This is a widely used proxy for cognitive skills, and often supplements education and experience in measures of human capital (Heckman 1995; Neal and Johnson 1996; Bowles, Gintis, Osborne, 2000; Osborne Groves 2006; Heckman, Stixrud and Urzua 2006). Males have a mean AFQT score of 40.63 and women have a mean AFQT score of 39.58 This difference is small and
insignificant. Managers have a considerably higher AFQT than non-managers. Managers have a mean score of 57.33, while non-managers have a mean score of 38.06 this is statistically significant (p=0.000) This test was administered in 1981.

**Age**

Age is taken from the 2010 wave of the sample when the respondents were between 45 and 53. This is an ideal age range, as those in this age range have had the opportunity to get married, have children, and advance in their careers, while not yet being of retirement age.

The mean age of the sample is 48.53, and does not differ significantly by sex or managerial status.

Age is a loose proxy for experience, which I avoid controlling for directly because if non-cognitive traits impact tenure, my estimates of the effects of the traits on occupational attainment will be downwardly biased. For this reason, I include a control for age². The purpose of including age² is that it more closely represents the effect of age on human capital. Human capital, and the returns to it, is not linear; they level off as one reaches a certain level of experience in their profession, and no longer are learning new skills, while their current ones may be decreasingly relevant.

**Marital Status**

Marital Status is a dummy variable, where 0=not married 1=married. The NLSY includes more specificity in the data, and code 2 as divorced, 3 as separated, and 6 as widowed, which I include in the not married category. 69% of managers are married, 55% of non-
managers are married, 59% of men are married (p=.000) and 55% of women are married (p=.05). This variable was part of the 2010 round.

**Children**

My control variable for children is the number of children that the respondent has had. The mean of this variable for the sample is 1.99. The mean for managers is 1.84. The mean for men is 1.94 and the mean for women is 2.03. The gender difference in the number of children is significant (p=.0084).
Table 1. Descriptive Statistics: NLSY79

<table>
<thead>
<tr>
<th></th>
<th>(1) Full sample</th>
<th>(2) Managers</th>
<th>(3) Non-Managers</th>
<th>(4) Males</th>
<th>(5) Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td>0.11 (0.307)</td>
<td>0.12*** (0.330)</td>
<td>0.05*** (0.282)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>locus of control</td>
<td>8.73 (2.402)</td>
<td>8.18*** (2.368)</td>
<td>8.79*** (2.398)</td>
<td>8.65** (2.421)</td>
<td>8.80** (2.382)</td>
</tr>
<tr>
<td>self-esteem</td>
<td>22.32 (4.022)</td>
<td>22.81*** (3.871)</td>
<td>22.15*** (4.003)</td>
<td>22.51*** (4.009)</td>
<td>22.14*** (4.026)</td>
</tr>
<tr>
<td>risk</td>
<td>4.84 (2.898)</td>
<td>5.38*** (2.459)</td>
<td>4.78*** (2.917)</td>
<td>5.20*** (2.893)</td>
<td>4.56*** (2.822)</td>
</tr>
<tr>
<td>female</td>
<td>0.50 (0.500)</td>
<td>0.42*** (0.495)</td>
<td>0.52*** (0.500)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>black</td>
<td>0.31 (0.463)</td>
<td>0.16*** (0.371)</td>
<td>0.33*** (0.470)</td>
<td>0.30 (0.460)</td>
<td>0.32 (0.466)</td>
</tr>
<tr>
<td>hispanic</td>
<td>0.18 (0.382)</td>
<td>0.14*** (0.345)</td>
<td>0.18*** (0.386)</td>
<td>0.18 (0.381)</td>
<td>0.18 (0.384)</td>
</tr>
<tr>
<td>white</td>
<td>0.51 (0.500)</td>
<td>0.70*** (0.459)</td>
<td>0.49*** (0.500)</td>
<td>0.52 (0.500)</td>
<td>0.50 (0.500)</td>
</tr>
<tr>
<td>highest grade</td>
<td>13.47 (2.482)</td>
<td>14.76*** (2.516)</td>
<td>13.31*** (2.433)</td>
<td>13.29*** (2.480)</td>
<td>13.63*** (2.473)</td>
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<tr>
<td>age</td>
<td>48.53 (2.228)</td>
<td>48.46 (2.205)</td>
<td>48.54 (2.231)</td>
<td>48.50 (2.249)</td>
<td>48.56 (2.208)</td>
</tr>
<tr>
<td>urban</td>
<td>0.78 (0.417)</td>
<td>0.76 (0.430)</td>
<td>0.78 (0.415)</td>
<td>0.78 (0.417)</td>
<td>0.78 (0.417)</td>
</tr>
<tr>
<td>number of children</td>
<td>1.99 (1.466)</td>
<td>1.84*** (1.305)</td>
<td>2.00*** (1.483)</td>
<td>1.94** (1.518)</td>
<td>2.03** (1.414)</td>
</tr>
<tr>
<td>married</td>
<td>0.57 (0.496)</td>
<td>0.69*** (0.463)</td>
<td>0.55*** (0.497)</td>
<td>0.59** (0.493)</td>
<td>0.55** (0.498)</td>
</tr>
<tr>
<td>afqt</td>
<td>40.09 (28.59)</td>
<td>57.33*** (28.23)</td>
<td>38.06*** (27.95)</td>
<td>40.63 (29.84)</td>
<td>39.58 (27.35)</td>
</tr>
</tbody>
</table>

N: 5720 603 5117 2786 2934

Mean coefficients; standard deviations in parentheses
H: diff = 0; *p < 0.1 ** p < 0.05 *** p < 0.01
5.2 Methodology

I use both a linear probability model (LPM) and a probit model in my empirical analysis. I aim to test the effect of non-cognitive traits on the probability of being employed as a manager. I predict that the likelihood of being employed as a manager should increase with decreasing values of locus of control (internal), increasing values of self-esteem, and increasing risk tolerance. The dependent variable in both models is a binary response variable for managerial status, where 1= manager 0=not manager. The binary nature of the dependent variable calls for the use of these models.

**Linear Probability Model**

**Model A:**

\[ y = Pr(\text{manager} = 1|x_i) \]

\[ = \beta_0 + \beta_1 loc_i + \beta_2 selfesteem_i + \beta_3 risk_i + \beta_4 female_i + \beta_5 (loci \times female)_i \]

\[ + \beta_6 (selfesteem \times female)_i + \beta_7 (risk \times female)_i + \beta_8 black_i + \beta_9 hispanic_i \]

\[ + \beta_9 age_i + \beta_{10} age^2_i + \beta_{11} urban_i + \beta_{12} children_i + \beta_{13} married_i \]

\[ + \beta_{14} education_i + \beta_{15} AFQT_i + u_1 \]

My first model (A), is a linear probability model; the LPM is a linear regression using ordinary least squares that has a binomial response dummy as the outcome variable. The coefficient estimates the effect of a one unit increase in the independent variable on the probability of being a manager, holding the other variables constant. The estimates are irrespective of the base value of x; a unit increase from 0 to 1 has the same effect as, say, an increase from 15 to 16. While the LPM is easy to use and interpret, there are several issues with
the LPM that may cause inefficient, inconsistent, or nonsensical results, and should be addressed.

The first problem with the linear probability model is that it violates the OLS assumption of homoscedasticity. Because of the dichotomous nature of the dependent variable, which represents the probability that \( y = 1 \) given \( x \), the error term’s value will be dependent on the value of \( x \). As a result, standard errors will be biased, and hypothesis tests will be incorrect. These issues may be minor, and I correct for them by using weighted standard errors.

The second issue is that the error term of a LPM has a binomial distribution instead of a normal distribution; it can only take on two values, one value for when \( y = 1 \), and the other for when \( y = 0 \). Consequently, it’s impossible for the error term to have a normal distribution. Additionally, the LPM assumes linearity and thus can give out-of-bounds predictions at extreme values of the independent variables. OLS assumes a continuous \( y \) variable, and allows the dependent variable to take on values from \(-\infty \) to \(+\infty \). This is nonsensical considering that probabilities must fall within the range \([0,1]\).

The last fault of the LPM is that of functional form. A linear probability model assumes that the effect of a change in \( x \) on the value of \( y \) is the same for all starting values of \( x \), hence it is linear; however, as often is the case with probabilities, this is not realistic. I expect that within very low (high) values of non-cognitive traits, a one unit decrease (increase) will not have as great of an effect as in the middle of the distribution of test scores. These issues with the LMP motivate the use of my second model.
Probit

Model B:

\[ y = Pr(\text{manager} = 1 | x_i) \]
\[ = \Phi(\beta_0 + \beta_1 \text{loc}_i + \beta_2 \text{selfesteem}_i + \beta_3 \text{risk}_i + \beta_4 \text{female}_i + \beta_5 (\text{loci} \times \text{female})_i \]
\[ + \beta_6 (\text{selfesteem} \times \text{female})_i + \beta_7 (\text{risk} \times \text{female})_i + \beta_8 \text{black}_i + \beta_9 \text{hispanic}_i \]
\[ + \beta_{10} \text{age}_i + \beta_{11} \text{age}^2_i + \beta_{12} \text{urban}_i + \beta_{13} \text{children}_i + \beta_{14} \text{married}_i \]
\[ + \beta_{15} \text{education}_i + \beta_{16} \text{AFQT}_i + u_i \]

My second model, a probit model, uses the cumulative distribution function of a standard normal distribution to transform the linear function into one that more appropriately fits the data. The CDF of a normal distribution is s-shaped, and is restricted to the range \([0,1]\), and so it is more appropriate for probabilities. The probit model uses maximum likelihood estimation instead of ordinary least squares, meaning it does not hold the other independent variables constant to determine the effect of \(x\) on \(y\), but finds the combination of \(x\)’s that maximize the probability of \(y\) equaling 1. Because maximum likelihood estimation is based on the distribution of \(y\) given \(x\), the heteroscedasticity is accounted for. The probit regression coefficients give the change in the z-score for a one unit change in the \(x\) variable. These on their own are not easily interpretable, so I will use the marginal effects of the independent variables on \(y\), calculated at the means. This should provide results similar to the ones in model 1.
Variables

The motivation of my empirical model is similar to the one used by Cobb-Clark and Tan (2011) in their study on non-cognitive traits and occupational segregation in Australia. The independent variables of interest in my model are locus of control, risk preference, self-esteem. My control variables are the AFQT, gender, marital status, number of children, age, education, location and race.

In addition the above covariates, I include interactions between the non-cognitive traits and the dummy for the variable female. This allows me to test whether or not the returns to these traits differ by sex. This method shows if these traits are valued differently depending on the sex of the person they belong to. If I find they are lower for women, then it may be appropriate to assume discrimination is affecting women's occupational attainment.

A concern raised in the literature on the effect of personality on economic outcomes is that causality may actually run from wages or occupation to personality, thus causing endogeneity issues (Borghans et al. 2008). Many researchers have defended the practice of using personality traits measured later in adulthood, as psychological literature has shown personality stabilizes in early adulthood (Costa and McCrae 1997). Although some have argued that self-esteem may be an exception to this finding, as intuitively it seems the most likely personality trait to demonstrate reverse causality. Fortunately, the NLSY79 measures locus of control and self-esteem in 1979 and 1980 respectively when respondents were in their late teens; due to their lack of experience in the labor market, I find it improbable that their labor market experience would affect their locus of control or self-esteem. This is one of the oft-noted benefits of using the NLSY to study the effect of non-cognitive traits on economic
outcomes (Fortin 2008; Osborne 2000). Risk aversion was only measured in 2010, but according to Jung and Treibich (2014), risk aversion is stable enough to be validly used to predict differences in economic outcomes between individuals across time, so this measure should suitably capture differences in the effects of risk preference on labor market decisions.

5.3 Results

(see table 2)
### Table 2. Linear Probability Model: Results

<table>
<thead>
<tr>
<th></th>
<th>(A) Model 1.a</th>
<th>(B) Model 1.b</th>
<th>(C) Model 1.c</th>
<th>(D) Model 1.d</th>
<th>(E) Model 1.e</th>
<th>(F) Model 1.f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus of control</td>
<td>-0.00550***</td>
<td>-0.00531***</td>
<td>-0.00273</td>
<td>-0.00246</td>
<td>-0.00212</td>
<td>0.00024</td>
</tr>
<tr>
<td></td>
<td>(0.00169)</td>
<td>(0.00177)</td>
<td>(0.00260)</td>
<td>(0.00269)</td>
<td>(0.00269)</td>
<td>(0.00265)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>0.00894***</td>
<td>0.00875***</td>
<td>0.0124***</td>
<td>0.0127***</td>
<td>0.0124***</td>
<td>0.00877***</td>
</tr>
<tr>
<td></td>
<td>(0.00102)</td>
<td>(0.00103)</td>
<td>(0.00160)</td>
<td>(0.00167)</td>
<td>(0.00167)</td>
<td>(0.00166)</td>
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<td>0.00573***</td>
<td>0.00793***</td>
<td>0.00623***</td>
<td>0.00635***</td>
<td>0.00480***</td>
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<td></td>
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<td>(0.00181)</td>
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<td>0.195***</td>
<td>0.202***</td>
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<td>Female x Locus of control</td>
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<td>-0.00422</td>
<td>-0.00444</td>
<td>-0.00420</td>
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<td>Female x Risk</td>
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<td>(0.00240)</td>
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<tr>
<td>Female x Self-esteem</td>
<td>-0.00714***</td>
<td>-0.00801***</td>
<td>-0.00816***</td>
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<td>(0.0101)</td>
<td>(0.0100)</td>
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<td>(0.00224)</td>
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</table>

N 6523 6931 6311 5720 5720 5720
R-sq 0.023 0.024 0.026 0.042 0.045 0.064

Standard errors in parentheses

*<0.1 ** p<.05 *** p<.01
Model 1.a

Model 1.a is a linear probability model with only locus of control, self-esteem, and risk tolerance as independent variables. The coefficient of locus of control is -.0055. This means that a unit change in the Rotter locus of control scale, which ranges from 4 to 16, towards externality (increase in value), will decrease the chance of holding a management position \((y=1)\) by .55 percent. The coefficient is small, but statistically significant (p-value=0.001). Because this model is linear, I can calculate that a move from the lowest value of locus of control to the highest decreases the probability of being a manager by 6.48%.

The coefficient self-esteem is .0089. This means that a unit increase in self-esteem, as measured by the Rosenberg scale, which ranges from 6 to 30 in the data, increases the probability of holding a management position by .89 of a percentage point. This coefficient is also statistically significant at the 0.000% level. A move from the lowest value of self-esteem to the highest increases the probability of being a manager by 21.36%.

The coefficient of the variable risk is .0066; a unit increase in risk tolerance increases the probability of being a manager by .66 of a percentage point. This coefficient is statistically significant (p-value=0.000). The NLSY risk scale ranges from 0 to 10, and thus a move from extremely risk averse to extremely risk tolerant increase one’s chance of being a manager by 6.6%

I interpret these results cautiously, as they are likely to be biased because of the excluded variables. Additionally, the R squared is small, at .0228, meaning that only 2.28% of the variance in the manager variable is explained by the variance of non-cognitive traits. However R squared on Thus far, these findings are in line with my hypothesis; the coefficient
on locus of control is negative, while the coefficients on self-esteem and risk tolerance are positive.

**Model 1(b)**

In Model 1(b), I keep the independent variables of locus of control, risk, and self-esteem from Model 1(a), and add a dummy variable for gender (0=male, 1=female) into the model. The coefficients on locus of control and self-esteem only change ten-thousandths of a percent, and the significance decreases slightly to (p=.003). Risk’s coefficient changes slightly, it decreases from .0066 to .0057, suggesting that the exclusion of gender from Model 1(a) was inflating the effect of risk on the dependent variable, albeit by a small amount. The coefficient for female is -.0281, so being a female lowers the chance of being a manager by 2.81%. The coefficient on the effect of being a woman is statistically significant at the 0.000% level (p-value 0.000).

**Model 1.c**

In model 1(c) I keep all of the variables used in model 1(b) and incorporate interactions between the non-cognitive traits and gender in order to see if these traits are valued differently between men and women. I interact locus of control, self-esteem, and risk with the female dummy variable. Females are more heavily penalized for a unit shift towards external control than men are, although the difference in slopes is insignificant. Women also have a lower return than men to risk tolerance, but the returns remain positive; however, they are not statistically significantly different either (p-value=0.633). Women and men have significantly different returns to self-esteem (p-value=0.000). Women’s returns are less than half that of men’s. The coefficient for self-esteem when female=0 is 0.012, while for women it is .0051.
The addition of the interaction variables changes the coefficient for female from negative to positive and increases it considerably (.186) and is significant at the 0.005% level; this suggests that differing returns to self-esteem were a driving factor causing women’s lower occupational attainment relative to men.

In Model 1(d-f), I include all of the variables from model 1(c) while adding a series of control variables. These only variables change the coefficients from model slightly, with no overall changes in significance. In model 1(d). These are the demographic variables: race, age, age squared, and urban/rural. Both race variables are negative, and significant. In model 1(e) the added controls are for household factors: number of children and marital status. Marital status has a coefficient of 0.03 and is significant at the 0.001% level. In model 1(f) I add the variables education and AFQT, which measure cognitive skills. The coefficient of AFQT is significant at the 0.000% level and is .0011. An increase from the mean (40.9) to the top percentile (99) increases the likelihood of being manager by 6.38%. An increase from the lowest to the highest percentile increases the probability of being a manager by 108.9%, illustrating the shortcomings of a linear model. In order to see if cognitive skills were more highly valued, I interacted male and female with AFQT (not shown) Men and women experience small, but statistically significant differing returns to AFQT (p-value=0.000). Women experience almost no benefit from a unit increase (.0002), while men have a modest one of 0.0018.
## Results 5.4: Probit

### Table 3: Probit Model Regression: Results

<table>
<thead>
<tr>
<th></th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
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<td></td>
<td>Model 2.a</td>
<td>Model 2.b</td>
<td>Model 2.c</td>
<td>Model 2.d</td>
<td>Model 2.e</td>
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<td>Children</td>
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**p<.1  *** p<.05  **** p<.01**
The structure of the models for my probit regression is the same as that for my linear probability model. I first test the non-cognitive skills alone, then add the dummy for female, then add the interactions, and then add my various controls.

Once I measure the marginal effects of the variables, the overall signs and statistical significance of matched those in the linear probability model. Like the in LMP, once I include interactions in the model the effect of being female becomes positive. Interestingly, the interaction between locus of control and female is significantly different. Suggesting that both locus of control and self-esteem effect women’s likelihood of being managers relative to men. The R-squares are low just as in the LPM, which is perplexing by might be because of the binary variable. Another, possibly more appropriate, measure of goodness of fit for non-linear models is the percent correctly predicted. My model does better by this metric; it predicted whether or not someone would be a manager in 89% of cases.
Conclusion:

My results show that women are less likely to be managers both because of their different levels of non-cognitive traits and their different returns to them. The first finding supports human capital theory. I argue that these differences are formed throughout a lifetime of gendered socialization. The differing returns to these traits, suggests biases that may cause employers to reward women less for traits they possess in equal measure to men. This is in keeping with the out-group homogeneity effect; these traits may be rewarded more highly in females than males, as nuances in personality are taken notice of more in men. Another explanation may be that women perform these traits differently in the marketplace; high self-esteem in a woman may not seem assertive, while in a man it may read that way.

I think that researchers interested in unequal economic outcomes should continue seek non-traditional explanatory variables to incorporate into their analysis, such as non-cognitive skills. I believe that solutions to discriminatory outcomes can be found only through incorporating research and analysis from other disciplines into the economics field.
Works Cited


---. "Supplement to Chapter 2: Human Capital, Effort, and the Sexual Division of Labor."


*Psychological Review*, vol. 88, no. 4, 1981, pp. 354-64.


